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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/961,391	09/25/2001	Kenneth J. Carstensen		5498

7590 05/08/2003
JONES, TULLAR & COOPER, P.C.
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EXAMINER

FLANDRO, RYAN M

ART UNIT	PAPER NUMBER
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3679

DATE MAILED: 05/08/2003

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/961,391

Applicant(s)

CARSTENSEN, KENNETH J.

Examiner

Ryan M Flandro

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 February 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,5,15,18 and 28-30 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,5,15,18 and 28-30 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities:
 - a. Recitation of “4,000” at page 15 line 8 should be changed to read “4.000” by replacing the comma with a period;
 - b. The use of the trademark “Seallube” has been noted in this application (page 17 line 15, page 18 line 22, and page 25 line 11). It should be capitalized wherever it appears and be accompanied by the generic terminology. Although the use of trademarks is permissible in patent applications, the proprietary nature of the marks should be respected and every effort made to prevent their use in any manner which might adversely affect their validity as trademarks; and
 - c. The word “these” at page 22 line 21 should be capitalized since it begins a sentence.
 - d. Appropriate correction is required.

Information Disclosure Statement

2. Applicant is advised that 37 CFR 1.98(a)(2) requires a legible copy of each U.S. and foreign patent; each publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed. The information disclosure statement filed 21 December 2001 complied with the aforementioned provision and the Examiner considered such references, but the references referred to therein have been separated from the

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application file. The Examiner respectfully requests that the Applicant submit new copies of those references along with any response to this action in order to complete the file.

Claim Objections

3. In light of Applicant's Amendment filed 05 February 2003, the objections to claims 15, 18 and 28 set forth in the previous Office action (paper no. 7) are hereby withdrawn.

4. Claim 1 is objected to because of the following informalities:

e. Recitation of "the male and female threaded sections are threadedly inserted to preselected penetrations in the coupler" is unclear because the female threaded section is integral with the coupler and, therefore, cannot be "threadedly inserted" in the coupler to a preselected penetration.

f. Appropriate correction is required.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. The rejection of claims 2,15, and 28-30 are hereby withdrawn in light of Applicant's arguments in the Amendment filed 05 February 2003 (paper no. 9, pages 5-6).

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7. Claims 18, 28, 29, and 30 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

a. Claims 18 and 28. Again, the Examiner stresses that the recitation of “API standards” and “ manufacturer’s specifications” renders the claims indefinite. Where a government or industry standard is used in a claim as a limitation, the claim does not comply with the requirements of 35 U.S.C. §112, second paragraph, because the claim scope is uncertain since standards are subject to change over time. In order to overcome this rejection, the effective date of the standard applied should be included in the specification (no new matter can be entered). Applicant is also encouraged to file a copy of the standard, (excerpts of the applicable portions are acceptable), via an information disclosure statement filed in accordance with 37 CFR 1.97 and 1.98.

b. Claims 18, 28, 29, and 30. Recitation in claims 18 and 28 that “the end regions of the coupling are in compression coextensive with the pin neck regions and the center region of the coupling is in tension coextensive with the torque disk” renders the claims indefinite because it is unclear how a rigid body can be in compression and tension at the same time in different regions along the same axial direction. Similarly, recitation in claim 29 that there is “compressive contact forces between the pin end shoulders and coupling end areas and pin thread end areas and the torque disk, and tension forces in pin neck areas and in the mid region of the sleeve coupling” renders the claim indefinite for the same reason set forth for claims 18 and 28. Claim 30 depends from claim 29 and is therefore rejected on the same grounds.

Claim Rejections - 35 USC § 103

8. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

9. Claims 1, 2, 5, 15, 18, 28, 29, and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Palone (US 3,859,503) in view of McCullough (US 1,851,714).

a. Claim 1. Palone shows a common connection for sucker rods used in strings in petroleum wells comprising a pair of sucker rods **36**, each having a pin end **44** with a flat traverse end face and at least an adjacent male threaded section; a coupler **40** having at least two interior female threaded sections **40A**, **40B** receiving the male threaded sections of the pin ends **44**, wherein the pin ends **44** of the sucker rods **36** include coupler end engagement members spaced apart from the end faces (see figure2).

i. Palone does not expressly disclose that the pin ends are dimensioned in length relative to the coupler to provide compressional loading forces between opposing end faces of the pin ends when the male and female threaded sections are matingly inserted to preselected penetrations in the coupler past engagement of the coupler engagement members with the coupler ends.

ii. McCullough, however, teaches coupler ends **34**, **35** dimensioned in length relative to a double ended pin **36** to provide compressional loading forces between opposing end faces of the coupler ends **34**, **35** when the male and female threaded sections are matingly inserted to preselected penetrations in the coupler ends **34**,

35 (see figures 1, 5, 6; column 1 line 42 – column 2 line 54; column 2 line 95 – column 3 line 2; column 5 lines 34-39; column 5 line 61- column 6 line 75; column 6 lines 109-114; column 6 line 130 – column 7 line 20). McCullough teaches such construction to provide more uniform loading throughout the connection, thereby reducing fatigue failure and extending the life of the connection (column 2 lines 77-81).

iii. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made modify the connection of Palone by dimensioning the pin end length relative to the coupler to provide compressional loading forces between opposing end faces of the pin ends in order to reduce fatigue failure in the connection as taught by McCullough.

b. Claim 2. The combination of Palone and McCullough, as applied to claim 1 above, includes the preselected penetration for each pin end being to a chosen displacement beyond insertion to a hand tight plane, whereby lengths of the pin end sections from the end faces are in compression and coextensive lengths of the coupler are in tension and the mating threads lock under prestress to inhibit relative movement (see McCullough figures 1, 5, 6; column 1 lines 28-31; column 5 lines 34-39; column 5 line 60 – column 6 line 75; column 6 lines 110-114).

c. Claim 5. The combination of Palone and McCullough further includes a torque washer **52** of a selected axial dimension with flat transverse sides and disposed centrally in the coupler **40** between the pin end **44** faces and engaged on each side by the flat end faces of the pin ends **44** (see palont figure 2).

d. Claim 15. The combination of Palone and McCullough, as applied above, includes a fatigue-resistant combination for interconnecting sucker rods **36** into a sucker rod string by joining opposing pin ends **44** with a coupler **40**, comprising a cylindrical coupler **40** having an interior axial bore and a central region with female threaded sections **40A**, **40B** at least on each axial side of the central region; a torque element **52** of a selected axial length disposed in the central region of the coupler **40** and having transverse end faces; a pair of pin ends **44** of sucker rods **36** engaged in the axial bore of the coupler **40** from opposite ends thereof; the pin ends **44** having flat end faces and adjacent male thread sections that are each matingly engaged into a female threaded section **40A**, **40B** of the coupler **40**, the end faces of the pin ends **36** engaging the opposite end faces of the torque element **52** to stress at least portions of the male thread sections of the pin ends **44** in compression (see McCullough) and associated portions of the coupler **40** in tension when the pin ends **44** are engaged in the coupler **40** to a displacement past a hand tight plane (see subparagraphs 8(a)(i-iii) above).

e. Claim 18. The combination of Palone and McCullough, as applied above, includes a connection for sucker rods **36** used in pumping in oil well installations, comprising a sleeve coupling **40** with an interior female threaded surface **40A**, **40B** and tensioned in accordance with API specifications (see McCullough column 1) and having end walls of given radial dimension; a pair of sucker rod pin ends **44**, each threaded into the coupling **40** from a different end, each of the pin ends **44** having a male threaded end portion with an end face transverse to the longitudinal axis of the rod **36**, a transverse shoulder **42** spaced from the end plane by a pre-stress dimension, and an undercut pin neck between

the root thread of the male thread and the transverse shoulder **42** (see Palone figure 2); a torque disk **52** having parallel planar faces spaced apart by an axial distance and the torque disk **52** being of different material than the pin ends **44**, where the spacing between the pin ends **44** and the shoulders **42**, and the axial distance between torque disk **52** faces are selected such that, with thread makeup to an operative tightness, the end regions of the coupling are in compression coextensive with the pin neck regions and in tension coextensive with the torque disk **52**, and pressure and frictional contact are maintained between the pin ends **44** and torque disk **52** and the end walls of the coupling **40** and the pin shoulders **42** (see Palone figure 2; McCullough figures 1, 5, 6).

iv. The combination of Palone and McCullough does not explicitly disclose the proportions of the sucker rod connection; however, an end face that deviates less than about 0.0005 inches from an end face plane, and faces deviating from a plane by less than about 0.0005 inches are within the scope of Palone's disclosure. Further, applicant is reminded that it has generally been recognized that the optimization of proportions in a prior art device is a design consideration within the skill of the art. In re Reese, 290 F.2d 839, 129 USPQ 402 (CCPA 1961).

v. Therefore, it would have been obvious to one with ordinary skill in the art at the time the invention was made to optimize the proportion of the sucker rod connection of McCullough for deviations less than about 0.0005 inches as such practice is a design consideration within the skill of the art.

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f. Claim 28. The combination of Palone and McCullough, as applied above, includes a connection for sucker rods **36** used in pumping installations in oil wells, comprising a sleeve coupling **40** with interior counter bores at each end region and with an interior female threaded surface **40A**, **40B** between the counter bores and dimensioned in accordance with API or manufacturer's specifications and having end walls of given radial dimension and axial dimension; a pair of sucker rod pin ends **44**, each threaded into the coupling **40** from a different end, each of the pin ends **44** having a male threaded end portion with an end face transverse to the longitudinal axis of the rod **36**, a transverse shoulder **42** spaced from the end face plane by a pre-stress dimension, and an undercut pin neck between the root of the male thread and the transverse shoulder **42**, and a torque disk **52** having parallel planar faces spaced apart by a predetermined axial distance between the torque disk **52** faces selected such that with thread makeup to an operative penetration in the coupling **40**, the end regions of the coupling **40** are in compression coextensive with the pin neck regions and the center region of the coupling is in tension coextensive with the torque disk **52**, and a compressive force and frictional contact are maintained between the pin ends **44** and the end walls of the coupling **40** and the shoulders **42**.

- i. McCullough does not explicitly disclose the proportions of the sucker rod connection; however, an end face that deviates less than about 0.0005 inches from a nominal end face plane is within the scope of McCullough's disclosure.

Further, applicant is reminded that it has generally been recognized that the

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optimization of proportions in a prior art device is a design consideration within the skill of the art. In re Reese, 290 F.2d 839, 129 USPQ 402 (CCPA 1961).

ii. Therefore, it would have been obvious to one with ordinary skill in the art at the time the invention was made to optimize the proportion of the sucker rod connection of McCullough for deviations less than about 0.0005 inches as such practice is a design consideration within the skill of the art.

g. Claim 29. The combination of Palone and McCullough, as applied above, includes a sucker rod coupling unit comprising a sleeve coupling **40** and two sucker rod pin ends **44** with predetermined dimensional criteria (see generally McCullough), and the pin ends **44** including pin neck areas and adjacent shoulders **42**, and coupling unit further including a torque disk **52** between the pin ends **44**, and being made up with torque or circumferential displacement methods to establish compressive contact forces between the pin end shoulders **42** and coupling **40** end areas and pin thread end areas and the torque disk **52**, and tension forces in pin neck areas and in the mid region of the sleeve coupling **40**; said induced forces imparting a pre-stress into the made up coupled unit at a degree calculated so as to be higher for each sucker rod size and material than any stresses induced by future operating loads.

i. Neither Palone, nor McCullough, specifies how the sucker rod coupling will function under certain induced forces. However, it is well established that a recitation with respect to the manner in which an apparatus is intended to be employed, *i.e.*, a functional limitation, does not impose any structural limitation upon the claimed apparatus which differentiates it from a prior art reference

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disclosing the structural limitations of the claim. In re Pearson, 494 F.2d 1399, 181 USPQ 641 (CCPA 1974); In re Casey, 370 F.2d 576, 152 USPQ 235 (CCPA 1967); In re Otto, 312 F.2d 937, 136 USPQ 458 (CCPA 1963). Furthermore, under the principles of inherency, if a prior art device, in its normal and usual operation, would necessarily perform the function claimed, then the function claimed will be considered to be anticipated by the prior art device. Since the prior art device comprises all of the applicants claimed structural limitations, it can be assumed the device will inherently function in a like manner regardless of whether the prior art reference explicitly discusses such capacity for performing the recited function. In re King, 802 F.2d 1324, 231 USPQ 136 (Fed. Cir. 1986). In re Ludtke, 441 F.2d 660, 169 USPQ 563 (CCPA 1971).

- h. Claim 30. The combination of Palone and McCullough, as applied to claim 29 above, further inherently includes dimensions such that when made up with either a torque or circumferential displacement method it establishes a pre-stress level in the unit that eliminates detrimental relative movement between the three-combined parts approaching or at the microstructure level of the materials used in the parts.

Response to Arguments

10. Applicant's arguments, see paper no. 9 pages 5-15, filed 05 February 2003, with respect to the rejection(s) of claim(s) 1, 2, 5, 15, and 29-30 under 102(b) and claims 18 and 28 under 103(a) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view

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of McCullough. In response to Applicant's argument that "Palone...was only concerned with using an embedded electrical heating circuit along the length of a sucker rod string to heat a high viscosity oil as it is pumped" and is "completely irrelevant to the present state of the art as to the improvement of couplings themselves and the reduction of fatigue life" (paper no. 9, page 10, 1st full paragraph), the Examiner acknowledges that Palone does not teach a connection directed to reduction in fatigue life but does in fact show and disclose the structure of a common sucker rod connection. Because Palone does not explicitly disclose any compressive and tensile prestressing, however, the argument is persuasive in this regard. McCullough is cited for such teaching.

11. Applicant's additional arguments with respect to claims 1, 2, 5, 15, 18, and 28-30 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following patents are cited to further show the state of the art with respect to sucker rod connections:

U.S. Patent 5,967,691 to Lancelot, III

U.S. Patent 3,729,219 to Crane

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13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ryan M Flandro whose telephone number is (703) 305-6952.

The examiner can normally be reached on 8:30am - 5:30pm Mon-Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lynne H Browne can be reached on (703) 308-1159. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9326 for regular communications and (703) 872-9327 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1113.

RMF
May 5, 2003

A handwritten signature in black ink, appearing to read "Lynne Browne", followed by a small "for" written below it.

Lynne H. Browne
Supervisory Patent Examiner
Technology Center 3670